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A WEEKLY EPITOME
OF
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MEDICINE.

(246) The Glycolytic Ferment of the Blood and the Pathogenesis of Diabetes Mellitus.

DR. L. SANSONI (*Riforma Medica*, July 7th, 8th, and 9th, 1891), in three interesting papers, deals with the new theory of the causation of diabetes propounded by Lépine. In these papers a very good summary is given of the various reasons for and against the theory. The author adds some experiments of his own which also tend to throw doubts on Lépine's views. The points of the controversy have been somewhat as follows: Mering and Minkowski found that by completely removing the pancreas from a dog they could render the animal diabetic. Complete removal was essential, for, if even a small portion were left, no glycosuria would result. Lépine confirmed the experiments of these observers, and propounded his new theory of the bipolar action of the pancreas, which gives this gland an important function in the prevention of diabetes. The following were Lépine's facts: (1) If glucose be mixed with healthy blood and the mixture kept at about 38° C. for about an hour, a large part of the glucose will disappear; if, however, the blood be derived from a dog rendered diabetic, the loss of sugar will be almost *nil*. (2) If chyle be used instead of blood, the loss will be much greater—nearly double. (3) Normal blood, when allowed to stand, loses more sugar than that of a diabetic dog, in which the loss is almost *nil*. This loss increases to some extent with rise of temperature, but at 51° C. it ceases. (4) The loss is at least 10 per cent. greater in spring than in summer. (5) Defibrinated portal blood from an animal killed during active digestion loses at least 20 per cent. more sugar in a given time than blood from the splenic vein or an artery of the same animal. (6) In the case of a dog rendered diabetic the loss is generally almost inappreciable; it very rarely amounts to one-sixth of that in normal blood. (7) Carbonic acid has an important influence in retarding this loss, which is not, however, prevented. (8) If blood from a normal animal be made to circulate through a kidney, it will lose in an hour 15 per cent. more sugar than if left to itself; in the case of a diabetic dog, this difference is only 6 per cent. Lépine explains the above facts by assuming the existence of a glycolytic ferment in normal blood; the diminution of this substance in diabetic blood; the greater amount of ferment in portal blood and in chyle than in splenic or arterial blood; an influence of temperature and of carbonic acid on this ferment; an influence of the tissues upon the destruction of sugar in circulating blood. This theory soon found an opponent. Arnaud, before the Académie des Sciences (January 26th, 1891), while admitting the facts, denied the existence of a glycolytic ferment, considering the property attributed to this body as a vital phenomenon, a property of albumen, which was partially lost after the production of diabetes. Lépine and Barral then defended their views in a further paper (Acad. des Sciences, February 23rd, 1891), in which they described a method of isolating the ferment from the blood. At any rate, they succeeded in obtaining a body with glycolytic properties by means of repeated centrifugalisation, not from the serum but from the corpuscles. This seemed a decisive answer to Arnaud's objections. The next opponent was Arthus, who said (Soc. de Biologie, April 18th, 1891) that the ferment does not pre-exist in the blood, but that destruction of sugar in shed blood is a cadaveric phenomenon like coagulation. He found that fibrin, separated from blood at the moment of its formation, was incapable of increasing glycolysis in blood; but if this fibrin were allowed to macerate for a few hours before removal it would then have powerful glycolytic properties. In decalcified or rapidly defibrinated blood kept at 40° C. he found that loss of sugar was very slight, or even *nil*, during the first quarter of an hour; after this the loss was rapid, but later it would diminish suddenly. Arthus considered, therefore, that the ferment was formed little by little in the blood. In answer to this, Lépine and Barral pointed out (Soc. de Biologie, April 25th, 1891) that the events of the first quarter of an hour were complex; in blood withdrawn from the vessels there was (1) destruction of sugar by glycolytic ferment, (2) formation of sugar at the expense of pre-existing glycogen, probably from the action of a diastatic ferment. They quoted instances in which they had actually seen an increase in the sugar during this time. They stated, too, that by defibrinating blood in the ordinary way a certain amount of glycolytic power remained in the fibrin; but that if the blood were collected directly in a basin, kept at 39° C., and containing fine sterile sand, defibrination being accomplished by shaking the basin, the glycolytic power in this case would be greater than before. This difference was found to be just equal to the sugar-destroying power of the fibrin removed in the first case. Lastly, they urged the necessity of knowing the conditions of feeding of the animals used, for a large meal would throw so much glycogen into the circulation that the subsequent sugar formation would quite obscure any results obtained. Lépine's

position is not, however, secure, for some experiments recently made by Gaglio (*Riforma Medica*, No. 21, 1891) first need explanation. This observer found that if, simultaneously with the removal of the pancreas, a ligature be applied to the left thoracic duct, no glycosuria will appear even after several days. Ligature of the thoracic duct after an animal has been rendered diabetic will also cause the glycosuria to cease. From this he concludes that the "something" which causes the glycosuria after removal of the pancreas passes along the intestinal lymphatics, and that the glycosuria is due to an accumulation of this substance in the blood, not to absence of a glycolytic ferment. As diabetes can be produced even in a dog which has fasted for some days, the substance cannot be glucose; it is suggested that it may be a ferment which converts the glycogen of the organs into glucose. Gaglio thinks that in health glucose does not appear in the urine because it is converted into glycogen; Mering and Minkowski have actually found disappearance of glycogen from the organs of diabetic animals. Sansoni attacks Lépine's theory from quite a different standpoint. He points out that it rests purely on results of analysis of blood which has been submitted to an elaborate series of manipulations; that the analysis is made by a method—that of Bernard—which has been proved incapable of giving that degree of accuracy which Lépine and Barral claim for it; that in his own results, which were obtained either by the method of Bernard or by a gravimetric modification which he considers more reliable, he has been quite unable to corroborate Lépine. In fact, he claims that in two estimations made on the defibrinated blood of a single individual, taking in the first 25 cubic centimetres and in the second 35 cubic centimetres, even with the greatest care it may happen that the calculated glycolytic power may be positive in the first instance, negative in the second—an error in the fourth place of decimals being sufficient to cause this difference. From this and similar arguments he concludes that Lépine's theory of the causation of diabetes is inexact. He does not deny that in many diabetic patients a diminished destruction of sugar may be a cause of the glycosuria; but in his opinion Lépine has failed to give an absolute proof of this. Methods of analysis which are less fallacious must first be employed, and an explanation is also necessary of Gaglio's remarkable experiments, in the face of which Lépine's theory of the bipolar action of the pancreas is scarcely tenable.

SURGERY.

(247) A New Method of Establishing a Gastric Fistula in Gastrostomy.

In a contribution to the *Centralblatt für Chirurgie*, of August 8th Dr. Oscar Witzel, of Bonn, describes a recently devised modification of the *technique* of gastrostomy, which, it is asserted, will prevent the escape of gastric juice, which in many instances causes so much trouble after this operation. The object of this procedure is to establish a canal, formed by stitching together the free borders of two parallel folds of the exposed wall of the stomach. This canal extends obliquely from the right downwards and to the left, where it communicates with a small opening made into the interior of the stomach, and an arrangement is thus established which resembles the lower extremity of the ureter as it passes obliquely through the wall of the bladder. It is necessary, in practising this method, to draw a large extent of the anterior wall of the stomach through the external wound. This, it is stated, can be readily effected, when the stomach is collapsed, by gentle and prolonged traction. Two parallel folds following the above-mentioned course are then taken up, the free margins of which are brought together by three or four Lembert's sutures, and by numerous ordinary sutures, over a flexible tube of the thickness of a lead pencil, the lower end of which tube is inserted into the small opening made into the stomach, whilst the upper end is intended to project from the external wound. The canal thus formed, which should be about 4 centimetres in length, is left exposed at the bottom of the wound when the stomach is fixed by sutures to the margins of the external incision. This modification does not necessitate any change in the other steps of the operation, and the surgeon can make the external wound according to his usual practice. Witzel exposes the sheath of the rectus by an incision made parallel to, and at a distance of a finger's breadth from the margin of the ribs; then, as is done in Mr. Howse's operation, he separates the fibres of this muscle in a vertical direction, and incises the transversalis obliquely from above downwards and from the right to the left. The division of the rectus thus crosses the wounds made through the skin and the transversalis. Witzel, who has operated in the manner described in this paper on two patients, has had good reason, he states, for being well satisfied with the results, and believes that his expectation of establishing a gastric fistula capable of being effectually closed by valvular action has been fulfilled. A similar procedure would, he thinks, be found useful in forming a suprapubic vesical fistula.

(248) Treatment of Divided Tendon.

M. Poncet, of Lyons, has lately described (*Rev. d'Orthop.*, July, 1891) an ingenious plan for overcoming the difficulty which is often experienced, especially in old cases, in bringing together the separated portions of a divided tendon. There can be no doubt as to the necessity of attempting to unite these portions by sutures, but the operation, though usually easy and effectual in recent cases of simple division, is difficult in cases both of recent division with much loss of substance, and of old lesion followed by considerable separation of the two ends as the result of muscular action and of the retraction of the divided portions of tendon. In many of these cases it will be found impossible to bring together the separated ends, and to maintain them in this relation by sutures. It occurred to the author that the necessary approximation might be effected by detaching and, subsequently, by fixing again at a higher level the process of bone into which the injured tendon is inserted. A case is reported in which complete division of the tendo Achillis, followed by wide separation, had caused a marked degree of equinism and disabling lameness. Very good results were obtained in this instance from a prolonged course of operative treatment, which consisted at first in separating by the saw the posterior extremity of the os calcis, which was left attached to the tendon; secondly, by replacing this fragment of bone at a higher level, and by fixing it to the os calcis with an ivory peg; and, lastly, by joining together by sutures the

divided ends of the injured tendon, which could now be brought into close apposition without undue traction. A like operation, it is stated, would be found useful in old cases of rupture of the ligamentum patellæ, in which there is often wide separation of the divided portions. In dealing with such a condition, M. Poncet would separate the tubercle of the tibia from the head of the bone, and then, as in the former case, would fix this detached process of bone still remaining united with the ligamentum patellæ to the front of the tibia at a higher level. If, however, as occurs in about half the number of cases, the tendon be torn away at its attachment to the tubercle, then its lower extremity, it is held, should be displaced in an upward direction, and fixed either by a small ivory peg or by suture to a higher portion of the head of the tibia. Separation of the tubercle of the tibia and subsequent replacement of this process, together with the insertion of the ligamentum patellæ, is advocated in the treatment of cases of old transverse fracture of the patella in which the fragments are so widely separated that they cannot be brought together except with great difficulty. A case of this kind is reported in which the tubercle, together with the ligament, was cut away from the tibia, and then replaced and fixed by an ivory peg at a higher point of the head of the bone, the distance of which from the normal position of the process corresponded to the amount of separation between the two fragments of the broken patella. The opposed surfaces of these fragments having been scraped could then be readily brought together, and were fixed by a wire suture passed not through the fragments of bone, but through the tendinous structures above and below the patella. This method of "mobilising" a tendon by osteotomy and displacement of the process into which it is inserted is likely to prove serviceable in cases in which free flexion of the forearm is hindered by retraction, due either to injury or to disease of the triceps tendon. M. Poncet states, in conclusion, that such operations as are here advocated should not be performed unless the means at the disposal of the surgeon and the local conditions of the affected limb are such as to ensure a perfectly aseptic treatment.

(249) A Bottle in the Rectum for Three and a Half Months.

In the *Vratch*, No. 31, 1891, p. 715, Dr. Ïvan Ï. Gokïeloff, of Salyany, Caucasian Russia, reports the case of a middle-sized, well-made, but pale and badly-nourished peasant, aged 45, who applied to him complaining of acute burning pain about the anus and hypogastric region, anorexia, frequent nausea and vomiting, and constipation alternating with diarrhœa, the stools being often blood-stained and mixed with mucus. The symptoms were attributed by the man to the fact that three and a half months previously, while gathering some wood in a forest, he had been attacked by five men from a near village, who had thrown him down and thrust a *vodka* bottle into his anus. On palpation, the whole abdomen was tender; the acutest sensation, however, was referred by the patient to the left iliac region where there could be made out a hard oblong body, lying obliquely in a vertical direction and reaching with its upper end a point about four fingers' breadth below the navel. A forefinger introduced into the rectum encountered, about three inches above the anus, a hard, smooth, circular object with a depression in the middle. All attempts at removal by massage, pressure through the abdominal wall, enemata, baths, etc., having failed, the patient was put under chloroform, after which the author introduced his right hand (after Simon's plan) into the bowel, forcibly pushed his fingers between the foreign body and the rectal walls, grasped the whole lower end of the object, and, while pressing with his left hand on its upper extremity through the abdominal parietes, succeeded with much difficulty in extracting the foreign body intact. It actually proved to be a *vodka* bottle, measuring 22 centimetres in length and 5½ in diameter. It was full of fæcal matter. The operation gave rise to some bleeding, about 3 ounces of dark blood being lost. The after-treatment consisted in opium, wine, warm compresses to the abdomen, with rest in bed. On the sixth day the man was discharged perfectly well. Dr. Gokïeloff points out (1) that, notwithstanding its three and a half months' sojourn in the bowel, the foreign body did not give rise to any grave phenomena (such as intestinal perforation, peritonitis, etc.); (2) that the patient had been able to move about freely and to attend to his work up to the time of his coming under the author's care; and (3) that the extraction could be accomplished only after forcible dilatation of the upper rectal sphincter.

MIDWIFERY AND DISEASES OF WOMEN.

(250) Rupture of Early Tubal Gestation Twice in Same Patient.

Dr. Veit (*Centralbl. f. Gynäk.*, July 25th, 1891) operated recently upon a patient who, three years previously, had been seized with collapse and hæmatocele from rupture of a tubal gestation sac on the right side. On the second occasion a similar attack of collapse occurred when the period was six days overdue; in the course of six more days three further attacks took place. Dr. Veit found the patient very anæmic and almost pulseless. He opened the abdomen, finding a great quantity of free fluid blood and clots in the peritoneal cavity. The right tube was closed at its abdominal end and somewhat dropsical. The left tube contained a fœtal sac, and a very minute rupture lay on its upper part. The patient ultimately recovered.

(251) Atresia.

Dr. Barsony (*Orvosi Hetilap*, Nos. 50–52, 1890) describes 14 cases of atresia of the female genital tract recently in Professor von Kézmárszky's wards. The deformity was congenital in 8 cases. In 6 it was acquired, in 5 from injuries during labour, and in 1 from small-pox. The atresia in 4 of the congenital cases was situated in the hymen, in 3 in the vagina; in 1 there was "combined hymenal and vaginal atresia." In 4 of the congenital cases there was distension of the vagina with menstrual blood (hæmatocolpos), in 2 hæmatocolpos and hæmatometra, in 1 both these conditions and hæmatosalpinx as well, and in 1 arrest of development of genitals and absence of the catamenia; 3 of the acquired cases had hæmatometra; in the remainder menstruation was suppressed. Simple atresia of the hymen or vagina was remedied by a crucial incision, or by the cutting out of an oval piece of the septum. To avoid, as much as possible, the entrance of air, neither the finger nor the sound was passed through the divided septum. No syringing was allowed, excepting when the re-

tained fluid was already decomposed, otherwise a simple antiseptic bandage was applied. Broader and deeper atresiæ were broken down by the finger or by cutting instruments after a vertical incision. To prevent fresh closure of the parts, the vagina was packed with iodoform gauze, a glass drainage tube inserted, and occasional dilatation practised. Dilatation of the Fallopian tubes with retained menstrual blood (hæmatosalpinx) did not require any abdominal operation in the case where it occurred, as the tubes gradually returned to their normal size after their contents escaped into the vagina. All the 14 cases of atresia ended in perfect cure.

(232) Metrorrhagia in the Third Week of the Puerperium or "Petit Retour."

Professor S. Remy (*Archives de Tocol. et de Gynéc.*, July, 1891) directs the attention of all practical obstetricians to the "show" so often observed between the fourteenth and twentieth days after normal labour. This is termed in France "*petit retour de couches.*" It appears to be more than accidental, and Dr. Remy is very uncertain as to whether it is pathological or physiological. Tarnier and Eustache imply that it is pathological, due to getting up too early, irritation of an unhealed laceration of the cervix, etc.; but Dr. Remy has noted the *petit retour* in 60 per cent. of lying-in women kept in the wards for seventeen days or longer. The prodromata were often marked hypogastric pains; enlargement of the uterus and general uneasiness were frequent. The suckling child sometimes suffered, but women who do not suckle are subject to the *petit retour*. The fact that the period does not necessarily recur one month after the *petit retour* would seem to indicate that the sanguineous flow is accidental, and slight accidents are common during the third week, when patient and nurse are sometimes careless. On the other hand, it is not improbable that the *petit retour* is a true but abortive catamenial process. Menstrual congestion of the uterus may go so far in the puerperium as to rupture vessels in process of repair, whilst later on, when the mucosa is normal, the congestion is slight, owing to determination of blood to the breasts, and not sufficient to cause any hæmorrhage. In any case, Dr. Remy concludes, the obstetrician must be careful; for if the show be pathological, the cause must be found out. If it represent menstruation, the patient will require much attention like any other menstruating invalid.

(233) Obscure High Temperatures in Childbed.

Dr. Henry C. Coe (*Amer. Journ. of Obstetrics*, June, 1891) contributes an article on "Elevation of Temperature of Obscure Origin during the Puerperium." It is possible, he insists, to have fever which is not due to infection during or after confinement. Septic infection through the genital tract is not the only cause of puerperal fever. In one case abdominal section was performed on the twenty-fourth day after confinement, the temperature having been very high for some days. An old abscess, completely cut off from the rest of the peritoneum by adhesions, and connected with the right ovary, was opened and drained. The cæcum was most probably involved, but the parts were disturbed as little as possible, and the patient recovered. The second case was more remarkable, as objective symptoms in the pelvis or elsewhere were entirely absent. There was no history of malaria, but the neighbourhood in which the patient lived was not above suspicion. Labour was short and normal, and antiseptic precautions were taken. On the eighth day a rigor occurred, with a rise of temperature to 105°. Antipyrin caused a fall to 103°, but two hours later a severe rigor took place, with a rise to 106.6° (in axilla), pulse 140. The uterus was curetted and washed out with carbolic acid, but there was no evidence of uterine sepsis, and the temperature kept high. After a few more rigors heavy doses of quinine were given. On the thirteenth day Dr. Coe gave 20 grains of quinine at noon and 20 at midnight, and continued the antiperiodic use of the drug in decreasing doses for several days. The temperature never rose above 99° after the thirteenth day, and the patient was up and about in the fourth week. The patient has twice been confined since the above described illness, without any complications.

(234) Lateral Obliquity of Gravid Uterus and its Dangers.

Dr. J. Bourrus (*Annales de Gynéc. et d'Obstét.*, July, 1891) considers that what has been termed lateral obliquity is only apparent, as it does not involve a true inclination of the uterus. It is caused by unsymmetrical development of the organ, a want of equality and parallelism in the growth of each half. When real lateral deviation is detected, that condition is purely secondary to the apparent inclination; in fact the uterus heaves over to the side on which it is most developed. Dr. Bourrus holds that the abnormal shape of the inclined uterus is the cause, not the effect, of the different positions which the fœtus assumes. It is especially the starting point of malpresentations, shoulder, face, breech, etc. It is also a cause of slow dilatation and of lingering labour, and is further pernicious in favouring uterine inertia and incarceration of the placenta.

(235) The Hermaphrodite from a Legal and Social Aspect.

Dr. Charles Debierre (*Annales de Gynéc. et d'Obstét.*, July, 1891) holds that a hermaphrodite is a being which is not developed sexually in conformity with the species to which it belongs, a being perverted both in its instincts and its psychosis in consequence of its abnormal, ill-defined sexuality. Hence, in the eyes of the law, it should be neither man nor woman; a separate class should be made for it; in short, it should be held as "neuter."

(236) Occlusion of Vagina; Subsequent Twin Pregnancy.

Dr. (Mlle.) Mesnard (*Archives de Tocol. et de Gynéc.*, July, 1891) reports a very complicated case. A patient, aged 21, married two years, first consulted her in February, 1888. The period had ceased since the preceding December, and the patient thought she must be four months pregnant. On examination, the vagina was found occluded one inch above the vulvar cleft. A soft, fluctuating tumour could be felt from the rectum; there was no evidence of pregnancy. The catamenia had appeared at 17; for ten months they were regular, after that date there was continuous metrorrhagia for a year. Yet she married, though very weak and anæmic. After her marriage the metrorrhagia ceased and the period became regular. Until amenorrhœa began, in December, 1888, neither the patient nor her husband had any suspicion that a malformation existed. The molimen was marked and

painful. Through six periods Dr. Mesnard observed this symptom and found that the soft tumour increased in size, whilst there was no show. Accordingly, the vaginal occlusion being complete, the septum was pierced with a trocar, and over half a pint of black, semisolid, odourless material escaped. Carbolised water was thrown up through the cannula by means of a hydrocele syringe. The cannula was then removed and numerous short incisions were made in the edge of the puncture by means of a probe-pointed bistoury. The finger could then be passed into the upper part of the vagina, which was very capacious. The uterus was normal, but rather bulky. On the first three or four days after the operation three vaginal injections were made, with carbolic acid 1 in 1,000, and sublimate 1 in 1,000. Nevertheless the temperature rose to 101° on the third day. At the end of a fortnight the cicatrisation of the vagina was complete, but the finger could no longer be passed through the cicatricial ring. The period returned with free show, twelve days after the operation, and recurred twice within two months later; at the third month, when the catamenia were due, there was neither show nor molimen. In the meantime the cicatrix was cautiously dilated with laminaria tents; but these were discontinued when the period ceased, for fear of exciting abortion. The softening of the tissues during pregnancy made the cicatrix so yielding that no further dilatation seemed necessary. In the later stages of pregnancy the fœtal head bore down very low, pressing on the perineum. A second fœtal head was detected in the left iliac fossa, and the abdomen was greatly distended. Labour was prolonged; the first child was delivered by forceps, as the heart sounds became very rapid. There was free flooding during the extraction of the head. The child was born alive, and the hæmorrhage ceased at once. The second child was delivered by forceps four hours later, with less hæmorrhage. A quarter of an hour later there was free flooding, and the placenta, which had a marginal attachment, was removed. Several violent hæmorrhages followed, only stopped by the injection of solution (about 2 ounces to the pint) of perchloride of iron in hot water. The patient recovered. The insertion of the cord was velamentous and marginal. Dr. Mesnard cannot account for the occlusion of the vagina, which was evidently not congenital. There was a notable absence of hæmorrhage before labour. The free flooding during and after the delivery of the head indicated marginal insertion of the placenta.

DISEASES OF CHILDREN.

(257) Intubation of the Larynx in Diphtheria.

Dr. Dionisio (*Gazz. Med. di Torino*, July 15th, 1891) has tried intubation of the larynx in twenty-seven cases of diphtheria, most of them in the hospital of S. Giovanni at Turin. The operation was only done when dyspnœa had become so urgent as to render surgical intervention necessary. In nineteen cases intubation alone was done, with six, or 31.5 per cent. recoveries. In eight cases tracheotomy was performed after intubation on account of blocking or other difficulties with the tube; of these two, or 25 per cent., recovered. Though not feeling himself justified in drawing a definite conclusion as to the relative merits of the two operations from so limited a number of cases, Dr. Dionisio states that his experience leads him to believe (1) that intubation in croup gives immediate good results in relieving dyspnœa; (2) that it does not seriously interfere with deglutition; (3) that it is easy, and quickly performed, is not dangerous to the patient, and is more readily agreed to by the friends; (4) that in many cases it may with advantage be substituted for tracheotomy, as it results in speedy cure, without a cicatrix in the neck, and without risk of consecutive stricture of the air passage from cicatrial contraction.

PHARMACOLOGY AND THERAPEUTICS.

(258) Experiments on the Action of the Salts of Strontium on the Organism.

M. Laborde (*Bull. de l'Acad. de Méd.*, July 21st, 1891) deals with the physiological action of the salts of strontium. Pharmacologists, relying perhaps too much on the close chemical similarity between barium and strontium, have generally assumed that the salts of the latter metal have an action on the body similar to those of the former. This, says M. Laborde, is quite erroneous, and he details a number of experiments in support of his views. The experiments were as follows: (1) The chloride was given to guinea-pigs and rabbits, either hypodermically or by intramuscular injection. Doses of 0.16 gramme to 0.2 gramme in the former, and of 0.4 to 0.5 gramme in the latter, did not produce the least appreciable effect, either local or general. (2) To a dog of medium size doses of 0.9 gramme to 1 gramme were given by intravenous injection. These also produced no ill effects, either on pulse or respiration, and even large doses could be given without either immediate or subsequent harm. (3) When administered by the stomach a dog can take doses as large as 2 and 3 grammes of chloride of strontium without any other symptom than a certain amount of diuresis. M. Laborde has also for some time past observed its action on himself and on a friend. He has thus proved that daily doses of from 1 gramme to 2 grammes are absolutely innocuous, even when continued for weeks or months, and that they may even have a beneficial action on the digestive function. (4) Experiments made with the bromide of strontium showed that on frogs, guinea-pigs, and dogs the salt has no action beyond that attributable to the bromine portion of the molecule. It is therefore recommended by him as superior to the corresponding potassium salt, being less toxic, better borne, and possessing probably at least equal value as regards its therapeutic effect in cases where potassium bromide is generally employed. The remainder of the paper is occupied by a description of experiments as to the comparative action of similar salts of barium, strontium, calcium, and potassium. As regards the first two substances, Rabuteau (*Comptes Rendus de la Société de Biologie*, 1883) has already given some information. He found that while doses of 0.275 to 0.4 gramme of chloride of strontium were innocuous when given to dogs by intravenous injection, 0.267 gramme of crystalline chloride of barium, given rapidly in the same way, produced a sudden cry, convulsions, and death. He noticed also that for some time after death there were remarkable fibrillary muscular contractions over the whole body. Rabuteau concluded that the drug killed by acting as a powerful cardiac poison. Laborde has repeated

the experiment, but by using smaller but still fatal doses, and injecting them more slowly, he has been able further to analyse the action, and to show that Rabuteau was only partially correct. He finds that the symptoms appear in the following order: the heart first becomes slower and the pupils dilate to their maximum; the animal then gives a shriek, its legs stiffen, urine is voided, and death follows with primary and definite arrest of respiration, the heart beats continuing, at first very quickly, and then resuming almost their normal characters during about ten minutes, after which the ventricles cease to contract. The symptoms are thus very similar to those produced by puncture of the medulla, and the author points out that barium must henceforth be classed among the poisons acting on this part. Another fact must be added to this—examination of the blood and muscles after death shows these of a bright red colour, just as in carbonic oxide poisoning. Metabolism is therefore almost instantly arrested by barium administered in this manner. To ascertain the effect of administration by the stomach some barium chloride was also given to a dog by means of the œsophageal tube. It was found to produce vomiting, choleraic diarrhœa, with a paretic condition and absolute collapse, death taking place in about three hours. Barium is thus in every way different in its action from strontium. The remaining conclusions may be stated as follows: (*a*) Animals or men taking salts of strontium with their ordinary food show increased appetite, nearly always increased weight, and the phenomena of assimilation and nutrition seem to be facilitated. (*b*) Under exactly similar conditions the salts of potassium rapidly provoke intolerance, unless very small doses be given. (*c*) Strontium appears besides to exercise an antiseptic action on tissues, liquids, and excreta; its presence in the intestine is incompatible with the existence of tænia in the dog, which fact would seem to show that it has a true parasiticide action. (*d*) Of the various salts the phosphate appears the most suitable for therapeutic use. (*e*) Lactate of strontium appears to act as a mild diuretic, the urine being always clear and limpid, contrary to what occurs during the use of salts of potassium. The therapeutic action of the strontium salts on man is, however, being fully studied by Professor Germain Sée, who will shortly communicate the results of his investigations.

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(359) Hydrochloric Acid in Diphtheria.

STARTING from the fact established by Roux and Yersin (*Bulletin Médical*, 1889) that the virulence of diphtherial toxins can be considerably diminished by slight acidulation of the bacterial products—especially with some mineral acid—Dr. S. H. Kraszewski, of Ivyë, resolved (*Gazeta Lekarska*, No. 28, 1891, p. 555) to try hydrochloric acid in six typical cases of croup in children, aged from ½ to 3, and in five cases of faucial diphtheria in two children and three adults. The following formula was used: ℞ Liq. ferri perchloridi, *Ph. Ross* (that is, equal parts of the iron salt and distilled water), 4 grammes; acidi hydrochlorici, 1.0 g.; aq. destillatæ, 200.0 g. M. D.S. A teaspoonful every fifteen minutes for one hour; then every thirty minutes for three or four hours; later on every hour. In faucial diphtheria the remedy was applied locally as follows: ℞ Liq. ferri perchloridi, *Ph. Ross.*, 8.0 g.; acidi hydrochlorici, 1.0 g.; aq. destill., 30.0 g. M. D.S. To be painted over the affected area with cotton wool every two hours, a fresh piece being used on each occasion. The treatment lasted from two to five days, the only adjuvants employed being frequent gargling with a 4 per cent. solution of boracic acid in faucial diphtheria and the internal administration of a 1.5 per cent. solution of sulphate of copper in croup (as an emetic when symptoms of laryngeal obstruction were present). Every one of the patients made an excellent recovery. In four out of five faucial cases the diphtheritic deposits vanished completely and permanently in from twenty-four to forty-eight hours, the throat becoming normal within three or four days. The fifth patient recovered in a week. The laryngeal cases (of which two had been apparently hopeless) were cured in from three to five days. In none were any unpleasant accessory effects observed.

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(360) Therapeutic Effects of Tuberculin.

THE following is an abstract of the official report of an "Experimental Investigation on Tuberculin at H.I.M.'s Army Hospital, Tokio, which is published in the *Sei-I-Kwai Medical Journal* of June 27th, 1891. The injections were commenced on April 6th in 22 patients, of whom 11 were suffering from phthisis, as proved by the presence of bacilli; and 8 had the ordinary symptoms of phthisis, but no discoverable bacilli. Of the remaing 3, 2 were cases of syphilis and 1 of leprosy. All the patients were males between 20 and 35 years of age. Of the 11 proved cases of phthisis 8 were in the first stage of the disease, while in 3 there were cavities in the lungs. The number of injections given between April 6th and May 4th was 125, the greatest number in any one patient being 11, and the least 2. The initial dose in every case was 0.001 c.c., which was gradually increased to 0.015 c.c. The usual reactive phenomena occurred, but in no case did dyspnœa or any other dangerous symptom supervene. Night sweats ceased in most cases after two or three injections. Among the cases of bacillary phthisis the respiratory capacity increased in 7 (the greatest increase being 800 c.c.), decreased in 2 (the greatest decrease being 1,750 c.c., in a case in which hæmoptysis had occurred), and remained stationary in 2. In the non-bacillary cases the vital capacity increased in 6 and diminished in 2. In most of the cases the amount of expectoration first increased, then gradually diminished, and afterwards increased again; the sputum changing its character from purulent to mucopurulent, and finally to muco-serous. In most of the cases the increase of expectoration was accompanied by a corresponding increase of bacilli; as the treatment was continued the bacilli "became thinner and smaller, like those of leprosy, or broken like 'string-beans.'" In two or three cases the bacilli became so much diminished in number that they could scarcely be detected, but in no case did they altogether disappear. In no case in which bacilli were not present before the treatment was begun were they found in the sputum after the injections. Of the bacillary cases 4 gained and 6 lost weight; of the non-bacillary cases there was loss of weight in 2, and increase in 6. In the syphilitic cases (syphilitic ecthyma and acne syphilitica) five injections were given, amounting in all to 0.021 c.c. in each case. No antisyphilitic treatment was employed after the injections. A certain amount of constitutional reaction always followed, and locally there was congestion with increased discharge

of pus. In the leprosy case (facial tubercular leprosy) ten injections amounting to 0.085 c.c. were given. There was a certain amount of reaction, both local and general, and after the first injection the tubercles gradually diminished in size, and sensibility returned to a certain extent; but already at the date of report the good effects, such as they were, were beginning to fade away.

(261) Antipyrin in Diabetes Insipidus.

Two years ago Dr. Opitz published (*Deutsche med. Wochenschr.*, No. 32, 1889, p. 646) three cases of diabetes insipidus, which had been greatly benefited by the internal administration of antipyrin in the daily dose of from 2 to 6 grammes. Shortly afterwards Dr. I. I. Maslovsky, of Bürnak, described (*Philadelphia Medical and Surgical Reporter*, July 19, 1891. p. 79) a case of polyuria in a lad of 16, where substantial improvement had taken place under antipyrin and antifebrin. Dr. Alexandr P. Voinovitch, of St. Petersburg, now reports (*Bolnitchnaia Gazeta Botkina*, Nos. 26 and 29, 1891, p. 665) a case of diabetes insipidus apparently completely and permanently cured by antipyrin. The patient, a retired artilleryman, aged 33, whose father and brother had died from diabetes mellitus, was suddenly seized with insatiable thirst and polyuria during a severe attack of epidemic influenza. The daily quantity of urine occasionally rose to 13 litres. Antipyrin was given in 0.5 gramme doses from 8 to 12 times a day, the administration being divided into three distinct courses (one of six days' duration, another of ten days, and the third of seven), with intervals of three and twenty-three days respectively. The patient was discharged in perfect health on the fourteenth day after discontinuing the treatment, the daily amount of urine excreted oscillating between 650 and 1,100 grammes, and the amount of drink taken averaging 2,100. He still remained well at the date of report (about twelve months after the discontinuance of the treatment).

(262) The Cantharidin Treatment in Leprosy.

Professor Inoko, of the University of Tokio, has tried Liebreich's cantharidin treatment in four cases of leprosy and one of laryngeal tuberculosis (*Sei-I-Kwai Med. Journ.*, June 27th, 1891.) The injections caused severe pain, but no local reaction; they were, however, always followed by more or less rise of temperature in the leprosy cases, but not in the case of tuberculosis. In the patients suffering from leprosy the tubercles shrank and underwent softening; the ulcers showed a tendency to heal, which in some cases went on to complete cicatrisation. Sensation seemed to be improved at certain points, although there was no marked change as regards the anæsthesia as a whole. No alteration was observed in the enlarged nerves. In the case of tuberculous laryngitis cough and expectoration were notably diminished.

(263) Injections of Guaiacol, Eucalyptol, and Iodoform in Tuberculosis.

At a meeting of the Turin Medical Academy on July 3rd, Dr. Scarpa reported (*Rif. Med.*, July 17th, 1891) on the results which he had obtained in 14 cases (9 men and 5 women) by means of hypodermic injections of guaiacol, eucalyptol, and iodoform. Of these, 12 presented so marked an improvement, general as well as local, after the treatment, that they might be called cured. Dr. Bozzolo, in discussing the paper, said that in two cases in which he had tried the method the results had not been so brilliant.

OPHTHALMOLOGY.

(264) Subjective Light Sensations following Enucleation of the Eyeball.

Dr. J. W. Park (*Archives of Ophthalmology*, July, 1891) records the following very interesting case. Miss P., aged 33 years, a music teacher, had ophthalmia neonatorum four days after she was born, resulting in almost total blindness in both eyes. The left eye was quite blind, and with the right eye she could only discern the sun, moon, and a few colours. In April, 1885, panophthalmitis began in the right eye, for which it was enucleated on May 2nd, 1885. Three days after enucleation she began to have subjective sensations of light, varying in colour and degree of brightness, which continued up to the time that she was last seen, which was in December, 1890. The descriptions of these light sensations were as follows. It appeared as though there was a lighted candle in the orbit, most of the time of a bright white light; some days it resembled a red sunlight, and other days it was like twilight. The days resembling twilight she described as being very pleasant, but they were few in comparison to the others. She wished to be in total darkness if treatment would accomplish it. The white light would occasionally become so bright as to cause intense nervousness. This nervousness would always diminish, and sometimes disappear after she had been lying down several hours and resting. Occasionally she is in total darkness, but has had but two or three days of total darkness in five years. She would invariably obtain relief much more quickly by lying on her left side. Going out into the fresh air would also afford her some relief. Cold applications to the orbit would do no good, but cold water forced in jets into the orbit would relieve her for five or ten minutes. She is less annoyed when she is not busily engaged in any work that requires considerable mental effort. She has two or three bright days in succession, followed by one not so bright. No treatment afforded permanent relief. Large doses of bromide of potassium and ergot gave her some relief. There was no enlargement of the orbital end of the optic nerve. Pressure within any part of the orbit had no effect upon the light sensations, neither did it cause any pain.

(265) Incipient Cataract: its Etiology, Treatment, and Prognosis.

Risley (*Ophthalmic Review*, August, 1891) is of opinion that the prognosis in cases of incipient cataract is not so unfavourable as is generally supposed The hard and inelastic lens of advanced life is not necessarily an opaque lens, nor is approximately normal acuity of vision incompatible with old age. The opaque lens must therefore be regarded as an extraordinary condition to be explained by other causes than senility. A careful inquiry into the history of patients applying for relief for severe affections of the eye elicits the fact that they have usually been sufferers either from weak eyes, or from symptoms justly attributable to eye strain. Risley contends that these subacute pathological states pass into several forms of disease; by the onset, it may be, of some constitutional malady, by some extraordinary or

too prolonged use of the eyes, or by exposure to glares of light or to intense heat, and that such an occurrence is more likely to occur at a time of life when the vital processes are liable to impairment by disease, by overtaxing the energies, or by physiological changes, particularly in the female. Frequently, if indeed not usually, commencing early in life, these irritative processes are steadily progressive unless arrested by appropriate treatment. Especially included in this category are errors of refraction, particularly astigmatism or muscular defects. Subjectively we have the familiar grouping of symptoms known as asthenopia. These symptoms are due in the first place to disturbance in the circulation in the intraocular membranes. Chronic hyperæmia of the vascular choroid, however produced, must, it is obvious, 'cause increased intraocular tension, and thus lead to mechanical interference with the circulation of blood and secreted fluids. The improvement of vision noted in almost all the cases treated was in no case due to the absorption of the opacities already formed in the lens, but to the improved condition of the choroid and retina, and the clearing up of the vitreous webs, or the granular or sand-like deposits so frequently discovered in the anterior part of the vitreous body when examined with a convex glass. The treatment adopted was to require as complete rest as possible from all work at a near point, the use of smoked glasses when necessarily exposed to bright light, and the local employment of mild washes and astringents to the conjunctival sac, together with the moderate use of the mydriatics, preferably a solution of homatropine. Internally iodide of potassium or iodide of iron and bromide of potassium, or lithium, etc., if headache was a marked symptom. If these were not well borne the chlorides were substituted, or in many cases were used in alternation with the iodides. All existing errors of refraction were corrected. The following are the conclusions to which the author comes:—That cataract, although a disease of advanced life, is not necessarily a senile change, but originates in local pathological states involving the nutrition of the eye itself. That in the stage of incipiency cataract is amenable to treatment by such measures as are calculated to remove the pathological conditions upon which it depends; that we are, therefore, justified in giving a more hopeful prognosis to many persons with commencing cataract; that although the treatment may fail to arrest the progressive degeneration of the lens, the eye, by virtue of the treatment adopted, will be in a better condition for operation.

PHYSIOLOGY.

(266) Paralytic Phenomena following Section of Sensory Nerves.

EXNER found a short time ago that in the horse section of the superior laryngeal nerve—which in that animal is a purely sensory nerve—was followed by paralysis of the muscles of the larynx, or permanent cessation of the movements of the muscles of the larynx, on the same side, and after a time there is atrophy of these muscles. Pineles (*Centralb. f. Physiol.*, IV, No. 24, p. 741) finds, on searching the literature of this subject, that section of other nerves leads to results similar to those occurring in the larynx. Bell and Magendie both observed paralysis of muscles following section of purely sensory nerves. Bell found that in the ass section of the infraorbital nerve was followed by cessation of movement in the upper lip; while Magendie found that section of the trigeminus nerve was followed by immobility of all the parts in which sensibility is lost. Pineles has repeated Bell's experiment on a horse, and he finds that after section of the infraorbital nerve the upper lip remains as if it were paralysed. In bilateral section of these nerves the paralytic condition of the upper lip was very marked, and the animal could eat only with difficulty. In the rabbit section of the trigeminus is followed by loss of the movements of the whiskers, but otherwise the lip movements are unaltered. We may also refer to the loss of the movement of winking after section of the trigeminus.

(267) Action of Urea on the Vascular Walls.

J. MUNK several years ago, on perfusing blood to which urea was added through a surviving kidney, found that the addition of urea accelerated the blood stream, and increased the secretion from the kidneys. This result was also produced by sodic chloride, the sulphates and phosphates of the alkalies, creatin, sugar, creatinin, and other substances. The vaso-dilator action of the urea on the kidneys was not due to the action of the urea on the central nervous system, for it occurred in the excised and still living kidney. Cavazzani and Rebustello (*Archives Italiennes de Biologie*, Tome XV, Fasc. II, p. 181, May, 1891) have made somewhat similar experiments by perfusing blood mixed with urea through several organs, but in all cases the organs or parts were left *in situ*. The fluid perfused was 1 part of bullock's blood mixed with 2 parts of normal saline solution (0.75 per cent. common salt). The animals employed were dogs, cats, and rabbits. The quantity of urea added to the blood varied from 0.5 per cent. to 8 per cent. as a maximum. Urea possesses a marked vaso-dilator action not only on the blood vessels of the kidney, but also on the vessels of the brain, liver, and musculo-cutaneous vessels in the last case, as shown by its action on the blood vessels of the hind limbs. Speaking generally, the vaso-dilator action of urea is directly proportional to the quantity per cent. of urea present in the blood. The minimum percentage of urea required to cause vaso-dilatation is for the kidneys 0.5 per cent., and for the other organs mentioned 1 per cent. In opposition to Munk, the authors have never observed a secretion of true urine during their experiments.

DERMATOLOGY.

(268) Impetigo Herpetiformis.

DR. THEODOR DU MESNIL (*Archiv f. Derm. u. Syph.* Heft 5, 1891, p. 723) in a case of this rare disease found, on microscopic examination of the skin, confirmation of views which he had previously published. The papillary and superficial layers of the cutis were thickly packed with small cells, the papillary layer being distended and swollen. This infiltration zone ceased abruptly, but in the cutis the blood vessels were widened and the lymphatic vessels were distended. In the blood vessels of the cutis the intima was thickened, the hair follicles and the glands of the skin being intact. The structure of the epithelium surrounding the erythematous part was not altered.